Subject: Re: Convolution, IDL & Numerical Recipes
Posted by R.G. Stockwell on Fri, 01 Nov 2002 18:44:51 GMT
View Forum Message <> Reply to Message

David Fanning wrote:
> R.G. Stockwell (sorry@noemail.now) writes:
>
>
>> Perhaps you want to use the following keywords:
>> Check out the help file to see the effects the keywords
>> have on how the arrays line up to be convolved.
>> (Note: you must explicitly set center=0, or else it defaults
>> to 1)
>
>
> Alright, now, can you give me the layman's definition
> of the difference between spacial filtering (CENTER=1)
> and convolution "in the strict mathematical sense"
> (CENTER=0).
...

> Cheers,
>
> David

If I may answer quickly off the top of my head without thinking about
it or looking at the help files, then I'd say, .. uh.... hmmm.... oh I
better look it up.

Ok, convol is just about the most messed up piece of code that IDL has.
(Don't get me started about people using the letter "l" as a variable,
which to me is indistinguishable from the number "1").

The difference is quite profound between the two.

IF center = 0 EXPLICITLY, then
you have the sum of A[t-m/2+i] K[i]
NOTE that the index of A is a constant +i, this is a correlation.
The kernel shifts along, and the time series shifts along in the same direction.

IF center = 1 OR is ommitted, then
you have the sum of A[t-i] K[i]
NOTE that the index of A is now a constant - i, this is a convolution.
The kernel shifts along, BUT the time series is shifting backwards (in the opposite direction).

Also, the offsets move around too.

> Which would I use if I'm trying to make a pretty image? :-)

I suggest running all possible permutations of the keywords, and selecting the one that matches the textbook examples :)

; test code

```
a = indgen(10)
k = [1,2,3]

print,'____________________'
print,strcompress(string(convol(a,k,center=1)))
print
print,strcompress(string(convol(a,k,center=0)))
```

<results>

```
 0  8  14  20  26  32  38  44  50  0

 0  0  4  10  16  22  28  34  40  46
```

Note the way the results are not even similar! YAY!
